

Mathematics Test 2 of ACT

Pre-Algebra (23%) (13 to 14 questions). Questions in this content area are based on basic operations using whole numbers, decimals, fractions, and integers; place value; square roots and approximations; the concept of exponents; scientific notation; factors; ratio, proportion, and percent; linear equations in one variable; absolute value and ordering numbers by value; elementary counting techniques and simple probability; data collection, representation, and interpretation; and understanding simple descriptive statistics.

EXAMPLES taken from previous ACT practice and PLAN test
Answers to all of these questions are at the end of the document!

Basic Operations

3. Vehicle A averages 14 miles per gallon of gasoline, and Vehicle B averages 36 miles per gallon of gasoline. At these rates, how many more gallons of gasoline does Vehicle A need than Vehicle B to make a 1,008-mile trip?
- A. 25
 - B. 28
 - C. 44
 - D. 50
 - E. 72

YOU TRY Basic Operations:

1. In Urbandale, the temperature at noon on January 15 last year was -17°F , and this year the temperature at noon on January 15 was 41°F . By how many degrees Fahrenheit do these 2 temperatures differ?
- A. 68°
 - B. 58°
 - C. 36°
 - D. 29°
 - E. 24°
2. When a positive number is divided by 9, the remainder is 4. What is the remainder when x is divided by 4?
- A. 3
 - B. 2
 - C. 1
 - D. 0
 - E. Cannot be determined from the given information

3. Compatible numbers may be used to estimate quotients when dividing. For example, 21 and 3 are compatible since 3 divides into 21 without a remainder. The numbers 21 and 4 are NOT compatible since 4 does NOT divide into 21 without a remainder. Which of the following uses compatible numbers to estimate $343 \div 71$?

F. $300 \div 70$
G. $340 \div 70$
H. $343 \div 71$
J. $350 \div 70$
K. $350 \div 75$

4. The product $(-6)(-4)(5)$ is how much greater than the sum $-6 + (-4) + 5$?

F. -115
G. -105
H. 105
J. 115
K. 125

Square root approximation

19. What is the smallest integer greater than $\sqrt{58}$?

A. 4
B. 7
C. 8
D. 10
E. 30

YOU TRY Square root approximation:

1. Between which 2 consecutive integers does $\sqrt{61}$ lie?

F. 5 and 6
G. 6 and 7
H. 7 and 8
J. 15 and 16
K. 30 and 31

Ratio and Proportion

18. Janelle cut a board 30 feet long into 2 pieces. The ratio of the lengths of the 2 pieces is 2:3. What is the length, to the nearest foot, of the shorter piece?

F. 5
G. 6
H. 12
J. 15
K. 18

YOU TRY Ratio and Proportion:

1. A recipe that makes 90 cookies requires 4 cups of flour, 3 cups of sugar, and 1 cup of butter. If this recipe were reduced to make only 60 cookies, how many cups of sugar would the reduced recipe require?

- A. $\frac{1}{2}$
- B. $\frac{2}{3}$
- C. $1\frac{1}{2}$
- D. 2
- E. $2\frac{2}{3}$

Percent

7. If 40% of a given number is 8, then what is 15% of the given number?

- A. 1.2
- B. 1.8
- C. 3.0
- D. 5.0
- E. 6.5

Use the table below for questions 13 – 14.

A poll of 200 registered voters was taken before the election for mayor of Springdale. All 200 voters indicated which 1 of the 4 candidates they would vote for. The results of the poll are given in the table below.

Candidate	Number of voters
Blackcloud	50
Lue	80
Gomez	40
Whitney	30

13. What percent of the voters polled chose Whitney in the poll?

- A. 15%
- B. 20%
- C. 25%
- D. 30%
- E. 40%

14. If the poll is indicative of how the 10,000 registered voters of Springdale will actually vote in the election, which of the following is the best estimate of the number of votes Lue will receive in the election?
- F. 1,500
 - G. 2,500
 - H. 4,000
 - J. 5,000
 - K. 8,000
30. A formula used to compute the current value of a savings account is $A = P(1 + r)^n$, where A is the current value; P is the amount deposited; r is the rate of interest for 1 compounding period, expressed as a decimal; and n is the number of compounding periods. Which of the following is closest to the value of a savings account after 5 years if \$10,000 is deposited at 4% annual interest compounded yearly?
- F. \$10,400
 - G. \$12,167
 - H. \$42,000
 - J. \$52,000
 - K. \$53,782

YOU TRY Percent:

1. A booklet contains 30 pages. If 9 pages in the booklet have drawings, what percentage of the pages in the booklet have drawings?
- F. 30%
 - G. 9%
 - H. 3%
 - J. 1%
 - K. $\frac{3}{10}\%$
2. A Girl Scout troop's goal was to sell \$1,200 worth of cookies, and their actual sales were \$1,320. To the nearest percent, the actual sales represented what percent of the goal?
- F. 10%
 - G. 91%
 - H. 100%
 - J. 110%
 - K. 120%

3. The length of each side of a square is 25 meters. If the length of each side is increased by 1 meter to form a new square, the **perimeter** of the new square is what percent larger than the **perimeter** of the original square?
- F. 1%
G. 4%
H. $6\frac{1}{4}\%$
J. 25%
K. 26%
4. The Clothing Closet had a sale of 25% off the original price for all pairs of jeans. The original price of a certain pair of jeans was \$40.00. What was the sale price of the pair of jeans?
- F. \$10.00
G. \$15.00
H. \$25.00
J. \$30.00
K. \$31.00

Absolute Value and Ordering Numbers by Value

1. $|7 - 3| - |3 - 7| = ?$
- A. -8
B. -6
C. -4
D. 0
E. 8
42. What rational number is halfway between $\frac{1}{5}$ and $\frac{1}{3}$?
- F. $\frac{1}{2}$
G. $\frac{1}{4}$
H. $\frac{2}{15}$
J. $\frac{4}{15}$
K. $\frac{8}{15}$

Probability

51. An integer from 100 through 999, inclusive, is to be chosen at random. What is the probability that the number chosen will have 0 as at least 1 digit?

- A. $\frac{19}{900}$
- B. $\frac{81}{900}$
- C. $\frac{90}{900}$
- D. $\frac{171}{900}$
- E. $\frac{271}{1,000}$

YOU TRY Probability:

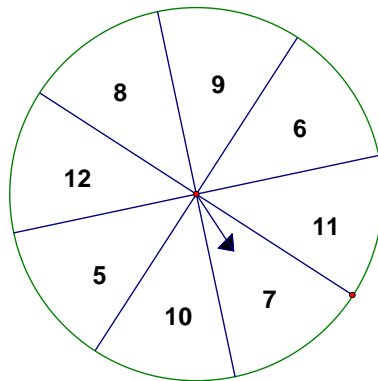
1. Given a square, a rectangle, a trapezoid, and a circle, if one figure is selected at random, what is the probability that the figure has four right angles?

- F. 1
- G. $\frac{3}{4}$
- H. $\frac{1}{2}$
- J. $\frac{1}{4}$
- K. 0

2. What is the probability that an integer chosen at random from the set of all positive integers less than 46 is a multiple of 4?

- F. $\frac{4}{45}$
- G. $\frac{10}{45}$
- H. $\frac{11}{45}$
- J. $\frac{12}{45}$
- K. $\frac{13}{45}$

3. When you play a certain carnival game, you must use the spinner shown below. You win if the region the pointer stops on a (7 or 9). Assume the pointer is equally likely to stop on any 1 of the 8 identically sized regions and does not stop on a line. What is the probability that the region the pointer stops on a (7 or 9)?



- A. $\frac{1}{8}$
 B. $\frac{1}{6}$
 C. $\frac{1}{4}$
 D. $\frac{1}{3}$
 E. $\frac{7}{11}$
4. You have the numbers 1, 3, 7, 8, and 10 and the letter D for a probability game. Your teacher is about to randomly draw 5 numbers from $\{1, 2, 3, \dots, 9, 10\}$ (without replacement) and then 1 letter from $\{A, B, C, D\}$. The probability that your teacher's 5 numbers will match yours is $\frac{1}{252}$. What is the probability that your teacher's 5 numbers and your teacher's letter will match yours?
- A. $\frac{1}{252 + 4}$
 B. $\frac{1 + 4}{252}$
 C. $\frac{1}{252} + \frac{1}{4}$
 D. $\frac{1}{252} \times 4$
 E. $\frac{1}{252} \times \frac{1}{4}$

Simple Statistics

28. A hiking group will go from a certain town to a certain village by van on 1 of 4 roads, from the village to a waterfall by riding bicycles on 1 of 2 bicycle paths, and then from the waterfall to their campsite by hiking on 1 of 6 trails. How many routes are possible for the hiking group to go from the town to the village to the waterfall to their campsite?

F. 6
G. 12
H. 24
J. 48
K. 220

33. The table below shows the total number of goals scored in each of 43 soccer matches in a regional tournament. What is the average number of goals scored per match, to the nearest 0.1 goal?

Total number of goals in a match	Number of matches with this total
0	4
1	10
2	5
3	9
4	7
5	5
6	1
7	2

A. 1.0
B. 2.8
C. 3.0
D. 6.1
E. 17.1

47. Tom has taken 5 of the 8 equally weighted tests in his U.S. History class this semester, and he has an average score of exactly 78.0 points. How many points does he need to earn on the 6th test to bring his average score up to exactly 80.0 points?

A. 90
B. 88
C. 82
D. 80
E. 79

YOU TRY Simple Statistics:

1. Jessica Dawn received marks of 87, 93, and 86 on 3 successive tests. What grade must she receive on a fourth test in order to have an average grade of 90?

A. 90
B. 91
C. 92
D. 93
E. 94

2. Al Unser won the Indianapolis 500 auto race 4 times between 1970 and 1990. His winning times, rounded to the nearest minute, were: 3 hours 13 minutes; 3 hours 10 minutes; 3 hours 6 minutes; and 3 hours 5 minutes. What is the average of the times listed?
- F. 3 hours 7.5 minutes
 - G. 3 hours 8.0 minutes
 - H. 3 hours 8.5 minutes
 - J. 3 hours 9.5 minutes
 - K. 3 hours 10.0 minutes
3. A gift shop offers 6 types of wrapping paper. The shop also offers 3 colors of bows that go with any type of paper, and 4 colors of cards that go with any type of paper and any bow. How many different combinations are possible if this shop wraps and decorates a gift by using 1 type of paper, 1 bow, and 1 card?
- F. 3
 - G. 12
 - H. 13
 - J. 22
 - K. 72
4. In order to earn an A grade in Ms. Friel's math class, a student must have an average score of at least 92 points on the 5 tests, each worth 100 points. One student has earned scores of 85, 93, 86, and 98, on the first 4 tests. What is the minimum score she must earn on her 5th test to have a test average of 92 points?
- A. 100
 - B. 98
 - C. 92
 - D. 91
 - E. It is not possible for this student to have a test average of 92 points.
5. What is the median for the data set below?
- 2, 2, 3, 5, 6, 6, 7, 7, 7
- F. 2
 - G. 3
 - H. 5
 - J. 6
 - K. 7

Answers:

Basic Operations

- 3. C
- 1. B
- 2. E
- 3. J
- 4. K

Square root approximation

- 19. C
- 1. H

Ratio and Proportion

18. H

1. D

Percent

7. D

13. A

14. H

30. G

1. F

2. J

3. G

4. J

Absolute Value and Ordering Numbers by Value

1. D

42. J

Probability

51. D

1. H

2. H

3. C

4. E

Simple Statistics

28. J

33. B

47. A

1. E

2. H

3. K

4. B

5. J